Journal of Dental Sciences and Education

Original Article

DOI: 10.51271/JDSE-0038

Attitudes and behaviors of dentists regarding rational drug use

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Cite this article: Bakır Ş, Bakır EP, Polat G, Temizyürek S. Attitudes and behaviors of dentists regarding rational drug use. *J Dent Sci Educ*. 2024;2(3):70-80.

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Received: 01/09/2024 ◆ **Accepted**: 21/09/2024 ◆ **Published**: 21/09/2024

ABSTRACT

Aims: Medicines, which have an important place in health services, are the greatest weapon of societies in preventing and combating diseases. If medicines are not used properly, they may not provide the expected effect and may lead to recurrence of some diseases, development of resistance or some side effects. In recent years, there has been a rapid increase in the number, variety and utilization rates of medicines. This situation has necessitated more rational behavior in the use of medicines, especially by healthcare professionals. Rational drug use can be briefly defined as the administration of appropriate medication in the light of anamnesis and clinical symptoms. Education on rational drug use remains as current in the dental profession as it is in the medical world. In order to determine the extent to which dentists meet the expectations regarding rational drug use and to eliminate possible problems, it is first necessary to determine their knowledge, attitudes, and behaviors on the subject. In this study, it was aimed at comparing and evaluating the attitudes and behaviors of dentists towards rational drug use.

Methods: Our study, which was approved by the ethics committee, was conducted with the participation of 399 volunteer dentists actively working in public hospitals and the private sector in different provinces of our country. The data for the study were obtained through an online questionnaire consisting of 15 questions. The IBM SPSS 25.0 package program was used for data analysis of the survey results. A frequency distribution table was created for general characteristics. A chi-square test was used to compare the relationship between categorical variables.

Results: It was determined that 50.6% of the participants received rational drug use training, 91.5% utilized different sources of information while prescribing, 73.4% did not prescribe drugs requested by patients, and 43.6% did not find the information given to patients about drugs sufficient. When the reasons for this were questioned, lack of information and lack of time were mostly cited. It was found that the level of knowledge of the participants about drugs was mostly focused on indications, route of administration, special conditions, and contraindications. When prescribing medications, the participants generally questioned whether the patients had chronic diseases, drug allergies, and other medications. It was observed that dentists mostly provided information about the duration of treatment, daily dosage, and method of administration regarding the drugs they prescribed.

Conclusion: The basis of irrational drug use in dentistry lies in a lack of knowledge and education. In order to obtain the expected benefit from drugs, we believe that, in addition to instilling awareness of rational drug use in society, the attitudes and behaviors gained, especially by physicians through undergraduate education and in-service training after graduation, should be supported by health policies.

Keywords: Rational medicine, dentist, specialization in dentistry

INTRODUCTION

Pharmaceuticals are an essential element of the health system. In parallel with the developments in medicine, there has been a great increase in the number and variety of drugs worldwide. However, it has been observed that if drugs are not used, when necessary, as much as necessary, and in the required manner, diseases may be prolonged or recur.[1] Studies have reported that excessive drug consumption leads to a number of side effects, including the development of resistance, difficult-to-treat health problems,[2] and an increased financial burden[3] on social security institutions.[4-8] In addition, drugs may deteriorate and fail to provide the desired benefit if they are not stored under appropriate conditions due to their chemical structure. This situation leads to a waste of resources and undermines confidence in the healthcare system.[9]

Although drug expenditures vary according to countries, they constitute a significant portion of health expenditures (7-30% of the budget in developed countries and 24-66% in developing countries).[10] The biggest obstacle to rational use

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of drugs is wrong drug policies, infrastructure deficiencies[11] and erroneous attitudes and behaviors (prescribing too many drugs, etc.) of healthcare professionals due to a lack of adequate training before/after graduation.[12]

In addition, patients' insistence or pressure on physicians by some pharmaceutical companies to prescribe certain drugs may affect prescribing behaviors.[13-15] The World Health Organization (WHO) has reported that more than half of the drugs are prescribed or sold off-label, and approximately one in five people use drugs without consulting a healthcare professional.[16] Studies have shown that women are more likely to use drugs without a doctor's advice.[17] Especially in our country, a significant proportion of people may use drugs without the advice of a physician, based on their previous experiences or the recommendation of friends.[7]

As a result of a study conducted in Mersin province, it was found that 26% of the patients who applied to primary health care institutions used drugs without the advice of a physician, 17% used drugs with the advice of their environment (family, friends, or neighbors), and 31.3% took their drugs from the pharmacy without a prescription.[18] These and similar situations may cause the masking of symptoms and thus delay the early diagnosis of diseases.[19]

The development of new treatment methods requires healthcare professionals to act more rationally when prescribing drugs.[9] Rational drug use is a dynamic process that includes "correct diagnosis of diseases, treatment with appropriate methods, prescribing effective, reliable, and low-cost drugs and using them at the appropriate dose, frequency, and duration, informing patients correctly, and monitoring treatment results. Through rational use of drugs, it is possible to prevent physiological, biological, psychological, and financial damages that may result from misuse.[20-24]

It is extremely important to raise awareness in society and especially among healthcare professionals (physicians, pharmacists, nurses, and other healthcare professionals to have adequate therapeutic knowledge) about the rational use of drugs.[4,7,25] In addition to the responsibility of healthcare professionals and the state, universities, professional organizations, pharmaceutical companies, and the media play a significant role in the healthy conduct of the process.[26] The attitudes and behaviors of university students and newly graduated physicians toward rational drug use shed light on the development of rational drug policies.[27]

Although comprehensive studies on rational drug use have been conducted in recent years, the number of these studies on dentistry is quite small. The aim of this study was to compare and evaluate the attitudes and behaviors of dentists actively working in public hospitals and the private sector in different provinces of our country towards rational drug use.

METHODS

The sample of this descriptive and cross-sectional study consisted of 399 dentists who were actively working in public hospitals and the private sector in different provinces of Turkiye and who agreed to participate in the study. In order to conduct the study, the necessary permission was obtained from the Dicle University Faculty of Dentistry Local Ethics Committee (Date: 26.05.2021, Decision No: 2021-31). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. The data for the study were obtained through an online questionnaire consisting of a total of 15 questions to determine the attitudes and behaviors of the participants regarding rational drug use as well as their descriptive information. In the first part of the questionnaire, four questions (gender, professional experience, specialty training, and specialty area) were used to question the socio-demographic characteristics of the participants. In the second part of the questionnaire, 11 questions (status of receiving rational drug use education, place of education, utilization of information sources while prescribing, most utilized information sources, prescribing the drugs requested by patients, finding the information given to patients about drugs sufficient, reason for not giving sufficient information, whether the information given is understood by patients, level of knowledge about drugs, which anamnesis information is used while prescribing drugs, and which information is given about prescribed drugs) were used to evaluate the attitudes and behaviors of the participants regarding rational drug use.

Data analysis of the questionnaire results was performed by transferring to the IBM SPSS 25.0 package program. Descriptive statistics were used in the evaluation of the data. A frequency distribution table was created for general characteristics. A chi-square test was used to compare the relationship between categorical variables. The findings were evaluated at a 95% confidence interval and $p<0.05$ was considered statistically significant.

RESULTS

When the gender distribution was evaluated based on the socio-demographic characteristics (Table 1), it was seen that 70.7% of the participants were "female" and 29.3% were "male". When the professional experience of the participants was questioned, it was determined that 61.4% had "1-5 years", 23.1% had "6-10 years", 5.8% had "11-15 years", 5% had "16-20 years", and 4.8% had "more than 20 years" of professional experience.

Table 1. Distribution of socio-demographic characteristics of the participants

		n	%
Gender	Female	282	70.7
	Male	117	29.3
Professional experience	1-5	245	61.4
	6-10	92	23.1
	11-15	23	5.8
	16-20	20	5.0
	Over 20	19	4.8
Specialty training in dentistry	Yes	197	49.4
	No	202	50.6
Dental specialty	Those without specialized training	202	50.6
	Pediatric dentistry	43	10.8
	Periodontology	37	9.3
	Restorative dental treatment	26	6.5
	Oral and maxillofacial surgery	24	6.0
	Endodontics	19	4.8
	Oral and maxillofacial radiology	18	4.5
	Orthodontics	16	4.0
	Prosthodontics	14	3.5
Total		399	100.0

When the specialty training in dentistry was analyzed, it was found that the proportion of "those with specialty training" (49.4%) was almost equal to "those without specialty training" (50.6%). Among the programs with specialty training, the highest rate was in "pediatric dentistry" (10.8%), followed by "periodontology" (9.3%), "restorative dental treatment" (6.5%), "oral and maxillofacial surgery" (6%), "endodontics" (4.8%), "oral and maxillofacial radiology" (4.5%), "orthodontics" (4%) and finally "prosthodontics" (3.5%).

When the status of receiving rational drug use training among the attitudes and behaviors of dentists regarding rational drug use was evaluated (Table 2), the proportion of the participants who received rational drug use training (50.6%) was almost the same as that of those who did not receive training (49.4%). When the places where rational drug use training was received were analyzed, it was found that 32.3% of the participants received this training from "faculties of dentistry", 18% from "ministry of health" and 0.3% from "pharmaceutical companies".

When the status of benefiting from information sources while prescribing was questioned, 91.5% of the participants emphasized that they "benefited from information sources" while prescribing, while 8.5% stated that they "did not". When the information sources most frequently used by the participants were investigated, "internet" ranked first (37.1%), followed by "Vademecum" (24.8%), "colleagues" (12.8%), "diagnostic and therapeutic guides" (6.5%), "drug information software programs" (4.5%), "pharmacology books" (3%), "Turkish drug therapy guide" (TIK-1.5%), and finally "research and promotion studies of pharmaceutical companies" (1%).

When the status of prescribing medicines requested by patients was evaluated, 73.4% of the dentists stated that they "did not prescribe medicines requested by patients" (previously used by the patient, recommended by others, purchased from a pharmacy, etc.), while 26.6% admitted that they "prescribed" them. When the adequacy of the information given to patients about medicines was analyzed, 56.4% of the participants reported that "the information given to patients about medicines was adequate", while 43.6% reported that "the information given was not adequate".

3% stated that they "did not have enough time", 4% stated that they "thought that patients would not pay attention to them about the use of medicines", 3.3% stated that "it was the duty of the pharmacist to explain the information in the prescription", and 3% stated that "patients had enough information about medicines". To the question "Do you check whether the information given about the drugs is understood by the patients?" 75.2% of the participants answered "yes", while 24.8% answered "no".

When the level of knowledge of dentists about drugs was questioned (Table 3), it was found that 98.7% of the participants found the level of knowledge about "indications for use of drugs" to be adequate (moderate, good, and very good), while 90% of the participants found the level of knowledge about "contraindications for use" to be adequate.

While 97.7% of the dentists thought that they had adequate knowledge about the "route of administration", 83.4% of the dentists thought that they had adequate knowledge about the "pharmacologic properties". The rate of those who stated that they had adequate knowledge about "side effects of drugs" was 83.2%, the rate of those who stated that they had adequate knowledge about "drug interactions" was 64.2%, the rate of those who thought that they had adequate knowledge about "warnings and precautions" was 78.5%, the rate of those who thought that they had adequate knowledge about "special conditions" was 94%, and the rate of those who thought that they had adequate knowledge about "bioequivalence of drugs" was 63.7%.

Table 2. Attitudes and behaviors of dentists regarding rational drug use

		n	%
Status of rational drug use training	Yes	202	50.6
	No	197	49.4
Place of rational drug use training	Those who did not receive training	197	49.4
	Faculty of dentistry	129	32.3
	Ministry of Health	72	18.0
	Pharmaceutical company	1	0.3
Utilization of information sources while prescribing	Yes	365	91.5
	No	34	8.5
The most commonly used sources of information when prescribing	Those who do not make use of information sources	35	8.8
	Internet	148	37.1
	Vademecum	99	24.8
	Colleagues	51	12.8
	Diagnostic and treatment guidelines	26	6.5
	Drug information software programs	18	4.5
	Pharmacology books	12	3.0
	Turkiye medication therapy guideline	6	1.5
	Research and promotion activities of pharmaceutical companies	4	1.0
Prescribing medicines requested by patients (previously used by the patient, recommended by others, bought from the pharmacy, etc.)	Yes	106	26.6
	No	293	73.4
Finding the information given to patients about medicines sufficient	Yes	225	56.4
	No	174	43.6
Reasons for not providing patients with sufficient information about medicines	Those providing sufficient information	222	55.6
	I do not have enough information about medicines	71	17.8
	Time is not enough	65	16.3
	I think patients will ignore me about the use of medicines	16	4.0
	It is the pharmacist's duty to explain the information in the prescription	13	3.3
	I think patients have sufficient information about medicines	12	3.0
Do you check that information about medicines is understood by patients?	Yes	300	75.2
	No	99	24.8
Total		399	100.0

Table 3. What do you think about your level of knowledge about medicines?

	Very bad		Bad		Moderate		Good		Very good	
	n	%	n	%	n	%	n	%	n	%
Indications	2	0.5	3	0.8	119	29.8	237	59.4	38	9.5
Contraindications	3	0.8	33	8.2	174	43.6	164	41.1	25	6.3
Method of application	2	0.5	7	1.8	126	31.6	194	48.6	70	17.5
Pharmacological properties	12	3	54	13.6	226	56.6	89	22.3	18	4.5
Side effects	7	1.8	60	15	234	58.6	86	21.6	12	3
Drug interactions (drug/nutrient)	17	4.2	126	31.6	200	50.1	53	13.3	3	0.8
Warnings, precautions	19	4.8	67	16.7	187	46.9	121	30.3	5	1.3
Special conditions (pregnancy, pediatrics, etc.)	2	0.5	22	5.5	161	40.4	159	39.8	55	13.8
Bioequivalence	41	10.3	104	26	173	43.4	77	19.3	4	1

As can be seen from the findings, although most of the dentists stated that they have sufficient knowledge about drugs, almost half of the participants (43.6%) did not find the information given to patients about drugs sufficient. In addition, it is quite thought-provoking that while the most important source of information that dentists should utilize when prescribing drugs should be the literature, a significant proportion of the participants resorted to the internet or the resources published by pharmaceutical companies (good prescribing guides) to obtain information.

When it was investigated which anamnesis information the dentists utilized while prescribing drugs (Table 4), it was found that 65.4% of the participants always questioned "other drugs used by the patients", 87.2% always questioned "whether the patients had drug allergies", 38.3% always questioned "whether the patients had liver disease", 35.8% always questioned "whether the patients had kidney disease", 71.4% always questioned "whether the patients had a chronic disease", 78.9% always questioned "whether the patients were pregnant", and 70.7% "always considered the age of the patients".

When the information provided by dentists about the drugs, they prescribed to their patients was analyzed (Table 5), it was found that 70.1% of the participants "frequently" and "always" provided information about the "name of the drug", while 92% of the participants provided the same information about the "method of administration" and "daily dosage". While 92.2% of the participants stated that they "often" and "always" gave information to their patients about the "duration of treatment", 74.7% of the participants who gave the same information about "when to stop taking the drug" were found to be 74.7%. When asked about providing

Table 4. Which anamnesis information do you utilize when prescribing medication?

	Never		Rarely		Sometimes		Often		Always	
	n	%	n	%	n	%	n	%	n	%
I will question the other medicines he is taking	0	0	5	1.3	37	9.3	96	24.1	261	65.4
I ask about drug allergies	1	0.3	1	0.3	5	1.3	44	11	348	87.2
I inquire about liver disease	6	1.5	11	2.8	118	29.6	111	27.8	153	38.3
I ask about kidney disease	6	1.5	15	3.8	110	27.6	125	31.3	143	35.8
I ask if he/she has a chronic illness	0	0	2	0.5	28	7	84	21.1	285	71.4
I question whether she is pregnant or not	8	2	18	4.5	2	0.5	56	14	315	78.9
I take his/her age into account	3	0.8	5	1.3	26	6.5	83	20.8	282	70.7

Table 5. What information do you give to your patients about the medicines you prescribe?

	Never		Rarely		Sometimes		Often		Always	
	n	%	n	%	n	%	n	%	n	%
Name of the medicine	1	0.3	29	7.3	89	22.3	145	36.3	135	33.8
Method of application	2	0.5	11	2.7	19	4.8	152	38.1	215	53.9
Daily dosage	4	1	9	2.2	19	4.8	152	38.1	215	53.9
Duration of treatment	1	0.3	4	1	26	6.5	133	33.3	235	58.9
When to stop taking the medicine	17	4.3	28	7	56	14	151	37.9	147	36.8
Mechanism of action of the drug	104	26.1	90	22.6	140	35	49	12.3	16	4
Possible side effects of the drug	35	8.8	88	22.1	164	41	86	21.6	26	6.5
The price of medicine	257	64.4	63	15.8	59	14.8	18	4.5	2	0.5
Interaction with other drugs/nutrients	100	25.1	126	31.6	101	25.3	62	15.5	10	2.5
Activities to avoid	100	25.1	75	18.8	112	28	88	22.1	24	6
Other warnings about medicines	44	11	71	17.8	122	30.6	132	33.1	30	7.5

information on the "mechanism of action" and "possible side effects" of the drug, the "sometimes" option received the highest rate of responses (35% and 41%, respectively). While 64.4% of the dentists "never" provided information about the "price of the drug", 1/4 of the participants emphasized that they "never" provided information about the "interaction of the drug with other drugs/foods" and "activities that the patient should avoid" (25.1%). The proportion of participants who "never" gave other warnings about medicines was 11%.

It was determined that there was no statistically significant relationship (p>0.05) between the status of specialty training in dentistry and prescribing the drugs requested by the patients, considering the information given about the drugs sufficient or checking whether the patient understood the drug after giving information about the drug. However, it was determined that there was a significant relationship (p<0.05) between the status of receiving specialty training and the status of receiving training on rational drug use, the place of training, or the reasons for not giving sufficient information about drugs to the patient (Table 6).

It was observed that there was no statistically significant relationship (p>0.05) between the status of specialty training in dentistry and the level of knowledge about indications of drugs or drug interactions. However, it was determined that there was a significant relationship (p<0.05) between the level of specialty training and the level of knowledge about contraindications, route of administration, pharmacological properties, side effects, warnings/precautions, special conditions (pregnancy, pediatrics, etc.), or bioequivalence of drugs (Table 7).

It was determined that there was no statistically significant relationship (p>0.05) between the status of specialty training in dentistry and the questioning of other drugs used by the patients, the presence of drug allergies, the presence of liver or kidney disease, or the consideration of the age of the patients. However, it was determined that there was a significant relationship (p<0.05) between the status of specialty training and the question of whether the patients had a chronic disease or were pregnant (Table 8).

It was found that there was no statistically significant relationship (p>0.05) between the status of specialty training in dentistry and giving information about the mechanism of action of the prescribed drug or activities to be avoided or making other warnings about drugs. However, it was determined that there was a significant correlation (p<0.05) between the status of specialty training and giving information about the name, route of administration, daily dose, duration of treatment, when to stop, possible side effects, price, or interaction with other drugs/nutrients (Table 9).

There was no statistically significant correlation (p>0.05) between the professional experience of the dentists and their utilization of information sources while prescribing, questioning whether there was a drug allergy, taking into account the age of the patients, and giving information about the method of administration or price of the prescribed drugs. However, again with the professional experience of dentists, the status of finding the information given to the patients about the drugs adequate, the reasons for not giving adequate information about the drugs, the questioning of other drugs used by the patients, the presence of liver or kidney disease, a chronic disease or pregnancy, the name of the drugs, daily dosage, duration of treatment, when to stop the drugs, mechanism of action, possible side effects, interaction with other drugs or nutrients, activities to be avoided, making other warnings about medications, or checking whether the patient understood after giving information about medications was significant (p<0.05).

Table 6. The relationship between the status of specialty training in dentistry and attitudes and behaviors related to rational drug use

Rational use of medicines related attitudes and behaviors		Do you have specialty training in dentistry?		X^2	p
		Yes	No		
Receiving training on rational use of medicines	Yes	83	119	11.233	0.001
		42.1%	58.9%		
	No	114	83		
		57.9%	41.1%		
Place of training on rational use of medicines	Faculty of dentistry	61	68	6.045	0.049
		73.5%	57%		
	Ministry of Health	22	50		
		26.5%	42%		
	Pharmaceutical company	0	1		
		0%	0.8%		
Reason for not providing patients with sufficient information about medicines	Time is not enough	28	37	16.305	0.003
		33.7%	39.4%		
	It is the pharmacist's duty to explain the information in the prescription	7	6		
		8.4%	6.4%		
	I do not have enough information about medicines	38	33		
		45.8%	35.1%		
	I think patients will ignore me about the use of medicines	1	15		
		1.2%	16.0%		
	I think patients have sufficient information about medicines	9	3		
		10.8%	3.2%		

Table 7. The relationship between the level of specialty training in dentistry and the level of knowledge about drugs

Level of knowledge about medicines		Do you have specialty training in dentistry? Yes	No	X^2	p
Contraindications	Very bad	3	0	30.574	0.000
		1.5%	0%		
	Bad	13	20		
		6.6%	9.9%		
	Middle	66	108		
		33.5%	53.5%		
	Good	106	58		
		53.8%	28.7%		
	Very good	9	16		
		4.6%	7.9%		
Method of application	Very bad	2	0	9.630	0.047
		1%	0%		
	Bad	1	6		
		0.5%	3%		
	Middle	72	54		
		36.5%	26.7%		
	Good	89	105		
		45.2%	52%		
	Very good	33	37		
		16.8%	18.3%		
Pharmacological properties	Very bad	10	2	28.055	0.000
		5.1%	1%		
	Bad	18	36		
		9.1%	17.8%		
	Middle	128	98		
		65%	48.5%		
	Good	29	60		
		14.7%	29.7%		
	Very good	12	6		
		6.1%	3%		
Side effects	Very bad	5	2	11.562	0.021
		2.5%	1%		
	Bad	23	37		
		11.7%	18.3%		
	Middle	125	109		
		63.5%	54%		
	Good	35	51		
		17.8%	25.2%		
	Very good	9	3		
		4.6%	1.5%		
Warnings, precautions	Very bad	7	12	28.897	0.021
		3.6%	5.9%		
	Bad	32	35		
		16.2%	17.3%		
	Middle	117	70		
		59.4%	34.7%		
	Good	40	81		
		20.3%	40.1%		
	Very good	1	4		
		0.5%	2%		
Special cases (pregnancy, pediatrics, etc.)	Very bad	2	0	10.167	0.038
		1%	0%		
	Bad	12	10		
		6.1%	5%		
	Middle	91	70		
		46.2%	34.7%		
	Good	65	94		
		33%	46.5%		
	Very good	27	28		
		13.7%	13.9%		
Bioequivalence	Very bad	36	5	35.813	0.000
		18.3%	2.5%		
	Bad	42	62		
		21.3%	30.7%		
	Middle	91	82		
		46.2%	40.6%		
	Good	26	51		
		13.2%	25.2%		
	Very good	2	2		
		1%	1%		

Table 8. The relationship between the status of specialty training in dentistry and the utilization of patients' anamnesis information when prescribing drugs

Utilizing anamnesis information when prescribing medication		Do you have specialty training in dentistry?		X^2	p
		Yes	No		
Questioning whether he/she has a chronic disease	Never	0	0	21.268	0.000
		0%	0%		
	Rarely	1	1		
		0.5%	0.5%		
	Sometimes	23	5		
		11.7%	2.5%		
	Often	51	33		
		25.9%	16.3%		
	Always	122	163		
		61.9%	80.7%		
Questioning whether she is pregnant	Never	8	0	36.930	0.000
		4.1%	0%		
	Rarely	17	1		
		8.6%	0.5%		
	Sometimes	1	1		
		0.5%	0.5%		
	Often	38	18		
		19.3%	8.9%		
	Always	133	182		
		67.5%	90.1%		

DISCUSSION

As a doctor or doctor-to-be, your main job when it comes to drugs is to make the right diagnosis based on the patient's symptoms and exam results, come up with a treatment plan that fits the patient's needs.[28] choose drugs based on their effectiveness, safety, and cost, give patients the right information, and check in on their progress.[29] Failures and deficiencies in the education of physicians lie at the basis of irrational drug use. It is known that physicians trained with drug-centered pharmacology education have difficulties using the knowledge they acquired after graduation in rational prescribing and adequately informing their patients. The main reason underlying this problem is that these pre-graduation trainings are more theory-oriented. It is very difficult for physicians who have not acquired the habit of rational prescribing before graduation to overcome this situation. Studies have shown that approximately 90% of prescribing errors are related to the lack of adequate training for newly graduated physicians.[30.] In a study conducted by Çınar, it was stated that people who received in-service training showed more positive behavior in prescribing than those who did not receive training.[31]

In a survey study conducted on 2413 medical school students and newly graduated physicians in the UK, it was reported that 74% of the participants found the education they received on rational drug use inadequate.[32] In a similar study, it was observed that senior medical students who had received training on rational drug use were more competent than senior medical students and general practitioners who had not received such training.[33]

Harmonizing national drug policies with the WHO's essential drug policy (creating drug use guidelines and essential drug lists) and teaching problem-based rational pharmacotherapy as part of health education curricula are the main things that need to be done to encourage more rational drug use.[34] WHO recommends a training model that includes appropriate drug selection and prescribing procedures (based on good prescribing guidelines) through written scenarios, taking into account the efficacy, safety, and costs of drugs.[28]

Rational drug use training, which has been successfully implemented in medicine and pharmacy for many years[35], is recommended to be adapted to the pharmacotherapy regulation process in dentistry.[29] Within the scope of initiatives to promote rational drug use, including problem-based rational pharmacotherapy education in the course and internship programs of dental faculty students in our country, this may prevent possible problems.[21,36,37] In line with this goal, the "national action plan for rational drug use" has started to be implemented. In this plan, physicians and patients should be informed regularly.[38]

The rational pharmacotherapy education model includes a systematic approach that the patient can easily comprehend in the stages of treatment organization and prescribing.[39] Thanks to this approach, physicians have the opportunity to explain the information without interruption, and the burden on patients to understand and retain the information correctly is lightened. Implementation steps of the rational pharmacotherapy education model:

- Making the correct diagnosis and explaining the diagnosis to the patient
- Communicating the purpose and appropriateness of the treatment to the patient,
- Arranging treatment details and providing necessary warnings,
- Agreeing on how treatment will be monitored and terminated,
- Ensure that the information shared with the patient is understood correctly.[40]

This model teaches dentists how to make the right drug choice, instead of recommending the use of a specific

Table 9. The relationship between the status of specialty training in dentistry and the information given about the prescribed drugs

What information is given about the prescribed medicines		Do you have specialty training in dentistry? Yes	No	X^2	p
Name of the medicine	Never	0	1	25.549	0.000
		0%	0.5%		
	Rarely	8	21		
		4.1%	10.4%		
	Sometimes	58	31		
		29.4%	15.3%		
	Often	55	90		
		27.9%	44.6%		
	Always	76	59		
		38.6%	29.2%		
Method of application	Never	1	1	15.101	0.004
		0.5%	0.5%		
	Rarely	3	8		
		1.5%	4%		
	Sometimes	2	17		
		1%	8.4%		
	Often	76	76		
		38.6%	37.6%		
	Always	115	100		
		58.4%	49.5%		
Daily dosage	Never	2	2	25.669	0.000
		1%	1%		
	Rarely	0	9		
		0%	4.5%		
	Sometimes	1	18		
		0.5%	8.9%		
	Often	83	69		
		42.1%	34.2%		
	Always	111	104		
		56.3%	51.5%		
Duration of treatment	Never	1	0	15.639	0.004
		0.5%	0%		
	Rarely	0	4		
		0%	2%		
	Sometimes	6	20		
		3.0%	9.9%		
	Often	61	72		
		31%	35.6%		
	Always	129	106		
		65.5%	52.5%		
When to stop taking the medicine	Never	14	3	19.492	0.001
		7.1%	1.5%		
	Rarely	11	17		
		5.6%	8.4%		
	Sometimes	16	40		
		8.1%	19.8%		
	Often	81	70		
		41.1%	34.7%		
	Always	75	72		
		38.1%	35.6%		
Possible side effects	Never	19	16	13.755	0.008
		9.6%	7.9%		
	Rarely	34	54		
		17.3%	26.7%		
	Sometimes	89	75		
		45.2%	37.1%		
	Often	36	50		
		18.3%	24.8%		
	Always	19	7		
		9.6%	3.5%		
Price of the medicine	Never	144	113	19.935	0.001
		73.1%	55.9%		
	Rarely	17	46		
		8.6%	22.8%		
	Sometimes	29	30		
		14.7%	14.9%		
	Often	7	11		
		3.6%	5.4%		
	Always	0	2		
		0%	1%		
Interaction with other drugs/ nutrients	Never	56	44	23.547	0.000
		28.4%	21.8%		
	Rarely	75	51		
		38.1%	25.2%		
	Sometimes	38	63		
		19.3%	31.2%		
	Often	20	42		
		10.2%	20.8%		
	Always	8	2		
		4.1%	1.0%		

drug in any indication, and shows the way to determine their personal drug list and organize the most appropriate treatment. Establishing a personal medication list for the most common indications will prevent dentists from making drug choices every time and reduce the risk of inappropriate medication being given to patients. Thus, patient harm and unnecessary workload can be prevented, and loss of time and self-confidence can be avoided.[37,40]

A dentist who receives training in accordance with rational drug use criteria will not only have sufficient pharmacology knowledge about the drugs he/she can prescribe but will also gain the ability to decide on the most ideal treatment among different alternatives. In order to determine to what extent trainings on rational drug use in the dental profession are effective, it is first necessary to determine the current knowledge, attitudes, and behaviors of general practitioners and specialist dentists on the subject.[37]

As a result of our study planned with these objectives in mind, it was observed that 58.9% of general practitioner dentists received rational drug use training, 57% of them obtained their training from the faculty of dentistry, and 42% from the ministry of health. Among specialist dentists, the rate of those who received rational drug use training decreased to 42.1%, and 73.5% of them received their training from the faculty of dentistry and 26.5% from the Ministry of Health. Based on the fact that the rate of those who did not receive this training was 49.4%, it is understood that rational drug use training is not fully provided to dentists during undergraduate education, in-service trainings organized after graduation, and especially during specialty training.

In our study, the rate of receiving training on rational drug use also differs among physicians who received specialization training in different branches. While the highest rate among programs with specialization training was seen in the "pediatric dentistry" (10.8%) program, the lowest rate was seen in the "Prosthetics" (3.5%) program. We believe that the reason for the difference between specialization programs varies depending on the frequency of drug use of physicians. However, it is worrying that despite the frequent prescription of medication in the field of oral and maxillofacial surgery, the education rate is only 6%. In a study conducted by Ekici,[41] no difference was found between prescribing behaviors of academicians and research assistants. We believe that the core curricula of specialty training institutions should include information on the importance of rational drug use and pharmacovigilance, issues to be considered while prescribing, in which cases, and how to report adverse effects, and these trainings should be reinforced with certificate programs.

Another important finding of our study is that 91.5% of dentists utilize information sources while prescribing. This result is an indication of how much dentists need information sources when prescribing medication. The fact that dentists mostly utilize the internet (37.1%) and Vademecum (24.8%) as information sources is due to their desire to access information quickly and easily. An unanticipated finding was that the rate of utilization of diagnostic and therapeutic guides was 6.5%, and the level of utilization of pharmacology books remained at 3%. The fact that 12.8% of the participants consulted their colleagues as a source of information indicates that dentists who could not find what they hoped for in reference books tended to prescribe by imitating their more experienced colleagues. When all the findings are evaluated together, it is clear that there is a need for an easily accessible, comprehensive, and up-to-date information source that can be used by dentists.

In our study, when the knowledge levels of the participants about drugs were examined, it was found that they had a high level of knowledge about indications, route of administration, special conditions (pregnancy, pediatrics, etc.), contraindications, pharmacological properties, side effects, and warnings/precautions, respectively. However, the level of knowledge on drug interactions (drug/nutrient) and bioequivalence was found to be moderate. It is possible to explain the low level of knowledge on these subjects by the scarcity of studies on them and the lack of sufficient information on them.

Although a significant number of dentists are aware of the harms of excessive drug consumption, they may prescribe unnecessary drugs due to their heavy workload and limited treatment time. Positive improvements have been found in the prescribing habits of dentists thanks to training on rational drug use.[42] It has been observed that physicians who can spare more time for their patients prescribe fewer drugs.[43]

In studies conducted on dentists in our country, it has been observed that antibiotics, which should be used mostly for the control of acute conditions and for prophylaxis,[44] are prescribed for many dental infections that can be easily treated without any benefit. According to 2006 data, antibiotics take first place with 20% of drug consumption rates in our country.[45]

It has been reported that antibiotic consumption is inversely proportional to the socio-economic development level of societies.[46] Excessive antibiotic consumption causes some bacteria to develop resistance to certain drugs, making it difficult to treat diseases.[47] Infections caused by resistant bacteria lead to prolonged hospitalizations and even increased mortality rates. This situation confirms the need for some regulations in the prescribing behavior of dentists.[48-51] Although certain progress has been made both in the world and in our country, thanks to the measures taken and some restrictions, antibiotic resistance still remains an important public health problem.

In a study conducted by Koyuncuoğlu et al.,[21] it was found that the rate of antibiotic use was 56.8% and the rate of analgesic use was 40.5% in patients receiving drug treatment due to dental problems. It was reported that 73.1% of the patients reused a medication that they had previously used for similar reasons; 9.8% had their physician prescribe medication and kept it at home thinking that it would be necessary; 47.3% did not consult anyone when using the medication, they kept at home due to dental problems; and only 25% consulted their dentist. It was emphasized that keeping medicines at home when they were not needed was a cause of waste. It is certain that the most important factor that reduces the unnecessary use of antibiotics is education and raising awareness in society.[52]

Analgesics are another group of drugs that are prescribed in considerable amounts in dentistry. In a study conducted at the Dicle University Faculty of Dentistry Hospital, it was found that the rate of over-the-counter analgesic use was 31.7%. Although the use of analgesics without a prescription

is thought to be more innocent compared to antibiotics, it should be kept in mind that their unconscious use without consulting a physician may pose a great risk.[53]

One of the important factors negatively affecting rational drug use is the prescription of drugs requested by patients. In a study conducted throughout Turkiye, it was reported that doctors prescribe medicines to avoid discussions with patients and it was suggested that necessary programs be carried out to raise public awareness and that informative posters be prepared. In addition to physicians' knowledge and experience in drug selection, it is also very important that they stay away from guidance.[54] In our study, although approximately ¾ of the participants stated that they did not respond positively to the requests of these patients to prescribe medication, this result is evidence that patients interfere with the prescribing behavior of dentists.

In our study, it was observed that the participants specifically questioned whether the patients had chronic diseases, drug allergies, and other medications while prescribing medication. We believe that these inquiries will prevent adverse drug interactions in cases of multiple drug use. It was found that dentists paid less attention to anamnesis information about patients' age, whether they had kidney or liver disease, and pregnancy status compared to other information when prescribing drugs. The fact that the participants questioned most of the anamnesis information "always" or "frequently" is evidence of the importance they attach to this information when prescribing medication.

CONCLUSION

In our study, it was found that dentists mostly informed their patients about the duration of treatment, daily dosage, route of administration, name, and when to stop taking the medication. Possible side effects are among the issues that need less information. The least informed topic was the price of medicines. From these findings, it can be concluded that participants do not attach much importance to the price of medicines when writing prescriptions. Although physicians have an obligation to inform patients about the diagnosis, treatment plan, prescribed drugs, and interventions to be performed, it is interesting to note that 43.6% of the participants admitted that they did not find the information given to patients about drugs sufficient, and ¼ of them admitted that they did not check whether the information given was understood by the patients. When the reasons for not providing information were questioned, the most common reasons given were that they did not have enough information about the drugs and that they did not have enough time. Although significant progress has been made in rational drug use in our country in recent years, problems arising from the serious lack of knowledge of both physicians and patients still persist. The way to overcome these deficiencies is to inform patients in a way that they can easily understand the treatment planning process. In order to ensure the expected benefits from medicines, it is necessary to instill awareness of rational use of medicines, make educational opportunities widespread and continuous, and protect the attitudes and behaviors acquired and support them with the necessary policies.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of the Dicle University Faculty of Dentistry Local Ethics Committee (Date: 26.05.2021, Decision No: 2021-31).

Informed Consent

All participants signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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